April 2021

HINGE ASSEMBLY FOR A DOMESTIC APPLIANCE AND DOMESTIC APPLIANCE HAVING A HINGE ASSEMBLY_ID-05315

Christian Mohr

HINGE ASSEMBLY FOR A DOMESTIC APPLIANCE AND DOMESTIC APPLIANCE HAVING A HINGE ASSEMBLY

The present invention relates to a hinge assembly for a domestic appliance, in particular an oven, for the treatment, in particular the thermal treatment, of food products.

Advantageously, the present invention also relates to a domestic appliance, in particular an oven, for the treatment, in particular the thermal treatment, of food products and having at least one hinge assembly.

There are known domestic appliances, such as ovens, for the treatment of food products. Such domestic appliances are known to comprise a main body having a treatment cavity within which food products are retained during their treatment, a door, which is moveable between a closing position and an opening position so as to impede or permit access to the treatment cavity and two hinge assemblies, which moveably couple the door to the main body.

A typical hinge assembly comprises a first coupling body mounted to the main body and a second coupling body mounted to the door. The First coupling body and the second coupling body are connected to one another by means of a connection arm.

The second coupling body is pivoted to the connection arm so as to allow for the movement of the door between the closing and opening position.

As it may become necessary from time to time to detach the door from the main body, it is known to removably couple the connection arm to the first coupling body.

It is further known that this removable coupling should not interfere with the correct operation of the door during a normal use; i.e. the door should not involuntarily detach from the main body. Therefore, it is aso known to foresee a saddle bracket defining a locking unit. The saddle bracket is pivoted to the connection arm and is moveable between an active angular position and a rest angular position so as to respectively allow and prevent interaction of the saddle bracket with the first coupling body. A typical solution foresees that the saddle bracket when being in the active angular position abuts against an edge provided within the first coupling body so as to create the locking force, which guarantees that the coupling arm remains coupled to

the first coupling body and therewith that the door remains attached to the main body and no involuntary detachments of the coupling arm from the first coupling body and of the door from the main body may happen.

Even though such solutions work satisfyingly well, it has been found that such solutions are prone to wear, possibly leading to a loss of the efficiency of the interaction between the locking unit and the first coupling body with the locking unit being in the active angular position.

Thus, a need is felt in the sector to improve the known hinge assemblies, and/or the known domestic appliances.

In particular, a need is felt in the sector to further improve the hinge assemblies in order to guarantee effectiveness of the hinge assemblies also over its complete life cycle and to improve the user experience during a disassembly of the door from the main body.

One aim of the present invention is to provide for a hinge assembly, to overcome, in a straightforward manner, at least one of the aforementioned inconveniences.

Another aim of the present invention is to provide for a domestic appliance to overcome, in a straightforward manner, at least one of the aforementioned inconveniences.

According to the present invention, there is provided a hinge assembly according to the independent claim 1.

Preferred non-limiting embodiments are claimed in the dependent claims directly or indirectly depending on claim 1.

According to the present invention, there is provided a domestic appliance according to claim 13.

Preferred non-limiting embodiments of a domestic appliance are claimed in the claims directly or indirectly depending on claim 13.

In addition, according to the present invention, there is provided a hinge assembly for a domestic appliance, in particular an oven, for the treatment of food products. The hinge assembly comprises:

- a first coupling body configured to be coupled to a main body of the domestic appliance;

- a connection unit removably connected to the first coupling body;

- a second coupling body configured to be coupled to a door of the domestic appliance and being pivoted to the connection unit and is configured to angularly move around a first pivot axis so as to control the second coupling body between at least a first angular position and a second angular position; and

- a locking unit pivoted to the connection unit and angularly moveable around a second pivot axis and moveable between at least an active angular position at which the locking unit is configured to interact with the first coupling body and a rest angular position, in particular at which the locking unit is detached from the first coupling body (i.e. the locking unit does not interact with the first coupling body). The locking unit comprises an engagement surface configured to abut against an abutment surface of the first coupling body with the locking unit being in the active angular position so as to generate a locking force for impeding detachment, in particular an involuntary detachment, of the connection unit from the first coupling body. Furthermore, the abutment surface and the engagement surface are parallel to one another with the locking unit being in the active angular position and/or are complementary to one another.

In this way, it is guaranteed that the abutment surface and the engagement surface contact one another over an extended two-dimensional contact area, which is in contrast to the known solutions, at which the interaction between the locking unit and the first coupling body is limited along a substantially one-dimensional contact line. Thus, according to the terminology of the present invention, an interaction edge of e.g. the first coupling body does not comprise an abutment surface.

According to some preferred non-limiting embodiments, the abutment surface and the engagement surface are designed such that the locking force originating, in use, from the interaction between the engagement surface and the abutment surface is directed into the second pivot axis or below the second pivot axis (with the hinge assembly being coupled to the main body and the locking unit being in the active

angular position). In this manner, one obtains a more efficient locking of the locking unit by defining a torque guaranteeing the locking unit to remain in the active angular position.

According to some preferred non-limiting embodiments, the hinge assembly is designed such that with the hinge assembly being connected to the main body and with the locking unit being in the active angular position, the abutment surface and the engagement surface are transversally arranged with respect to base walls of the main body. In particular, the main body comprises the two base walls spaced apart along a first axis and a lateral wall assembly arranged between the base walls. The base walls and the lateral wall assembly define and/or delimit a treatment cavity of the domestic appliance configured to be selectively opened or closed by the door.

According to some preferred non-limiting embodiments, the abutment surface and the engagement surface are multiform; i.e. the abutment surface and the engagement surface cannot be described by a simple plane.

According to some preferred non-limiting embodiments, the abutment surface and the engagement surface present curved profiles. This allows a smooth operation of the locking unit when angularly moving the locking unit between the active angular position and the rest angular position.

According to some preferred non-limiting embodiments, the abutment surface comprises at least a first surface portion and at least a second surface portion transversal and/or connected to one another and the engagement surface comprises at least a third surface portion and a fourth surface portion transversal and/or connected to one another. The respective third surface portion abuts against the first surface portion and the fourth surface portion abuts against the second surface portion with the locking unit being in the active angular positon.

Preferentially but not necessarily, the first surface portion and the third surface portion face and/or are parallel to one another and the third surface portion and the fourth surface portion face and/or are parallel to one another with the locking unit being in the active angular position.

By providing for a first and a second surface portion it is possible to define in

an easy manner the direction of the locking force.

According to some preferred non-limiting embodiments, the first surface portion and the second surface portion are connected to one another along a first connection portion and/or the third surface portion and the fourth surface portion are connected to one another along a second connection portion.

According to some preferred non-limiting embodiments, the abutment surface is mirror symmetric with respect to a respective mirror axis comprising the first connection portion and/or the engagement surface is mirror symmetric with respect to a respective mirror axis comprising the second connection portion.

According to some preferred non-limiting embodiments, the first connection portion and the second connection portion define a respective plurality of extrema, in particular of inflection points. In particular, if one considers a respective cross-sectional plane perpendicular to the respective first connection portion or the respective second connection portion, the intersection with the respective abutment surface or the respective engagement surface results in a curve having its extremum, in particular its inflection point, within respectively the first connection portion and the second connection portion.

According to some preferred non-limiting embodiments, the first surface portion, the second surface portion, the third surface portion and the fourth surface portion present curved configurations or plane configurations.

According to some preferred non-limiting embodiments, the abutment surface and the engagement surface comprises each one single respective plane surface portion. The hinge assembly is designed such that with the locking unit being in the active angular position and the hinge assembly being coupled to the main body the abutment surface and the engagement portion are parallel to an axis being vertical with respect to a support surface directly or indirectly carrying the domestic appliance.

According to some preferred non-limiting embodiments, the connection unit comprises at least a connection arm connected to the second coupling body and removably connected to the first coupling body and the locking unit comprises at least two lateral elements spaced apparat from one another and interposing at least a portion

of the connection arm between one another and a coupling member connecting the two lateral elements with one another. Each lateral element comprises at least a respective section of the engagement surface.

According to some preferred non-limiting embodiments, the connection unit comprises at least a connection arm connected to the second coupling body and removably connected to the first coupling body and the locking unit comprises at least two lateral elements spaced apparat from one another and interposing at least a portion of the connection arm between one another. At least one, preferentially both, of the lateral elements comprises a respective ribbed gripping surface. The presence of the ribbed gripping surface allows a better gripping of the locking unit and therewith an improved control of the locking unit between the active angular position and the rest angular position.

According to some preferred non-limiting embodiments, the first coupling body comprises a housing having an opening for receiving at least a portion of the connection unit and the housing comprises at least two lateral walls at least partially delimiting the opening and each lateral wall comprises a respective section of the abutment surface.

In particular, with the locking unit being in the active angular position, one lateral wall is in contact with one respective lateral element and the other lateral wall is in contact with the other lateral element.

In addition, according to the present invention, there is provided a domestic appliance, in particular an oven, having a main body, a door and at least one hinge assembly according to the present invention for moveably coupling the door to the main body.

According to some preferred non-limiting embodiments, the main body comprises two base walls spaced apart along a first axis and a lateral wall assembly arranged between the base walls. The base walls and the lateral wall assembly define and/or delimit a treatment cavity of the domestic appliance configured to be selectively opened or closed by the door and the main body comprises at least one receiving seat for the first coupling body.

According to some preferred non-limiting embodiments, the door is detachable from the main body with the locking unit being controlled in the rest angular position.

Three non-limiting embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

- Figure 1 is a schematic perspective view of a domestic appliance having at least one hinge assembly according to the present invention, with parts removed for clarity;
- Figure 2 is a side view of a hinge assembly according to a first embodiment of the present invention, with parts removed for clarity;
- Figure 3a is a partially exploded and perspective view of portions of the hinge assembly of Figure 2, with parts removed for clarity
- Figure 3b is an enlarged perspective view of a detail of the hinge assembly of Figures 2 and 3a, with parts removed for clarity;
- Figure 4 is an enlarged side view of some other details of the hinge assembly of Figures 2 and 3, with parts removed for clarity;
- Figure 5 is a side view of some details of a hinge assembly according to a second embodiment of the present invention, with parts removed for clarity;
- Figure 6a is a partially exploded and perspective view of the hinge assembly of Figure 5, with parts removed for clarity;
- Figure 6b is an enlarged perspective view of a detail of portions of the hinge assembly of Figures 5 and 6a, with parts removed for clarity;
- Figure 7 is a side view of some details of a hinge assembly according to a third embodiment of the present invention, with parts removed for clarity;
- Figure 8a is a partially exploded and perspective view of portions of the hinge assembly of Figure 7, with parts removed for clarity; and
- Figure 8b is an enlarged perspective view of a detail of the hinge assembly of Figures 7 and 8a, with parts removed for clarity.

With particular reference to Figure 1, number 1 indicates as a whole a domestic appliance, in particular an oven, for the treatment, in particular the thermal treatment, of food products.

According to some preferred non-limiting embodiments, domestic appliance 1 comprises at least:

- a main body 2 comprising a treatment cavity 3 for the treatment, in particular the thermal treatment, even more particular for the heating, of the food product;

- a door 4 configured to selectively open or close an opening of main body 2 so as to allow or impede access to treatment cavity 3; and

- at least one, preferentially two, hinge assemblies 6 (shown in Figures 2 to 4) configured to moveably couple door 4 to main body 2.

Preferentially, main body 2 comprises two base walls 7 spaced apart along a first axis A, in particular being vertically oriented, and a lateral wall assembly 8 arranged between base walls 7. In particular, base walls 7 and lateral wall assembly 8 at least partially delimit treatment cavity 3 and the opening.

Even more preferentially, base walls 7 are (substantially) parallel to one another and to a (horizontal) support surface directly or indirectly carrying domestic appliance 1.

Preferentially, lateral wall assembly 8 comprises at least three lateral walls 9, in particular (substantially) parallel to first axis A, and each being interposed between base walls 7. In particular, one lateral wall 9 faces the opening and the other two lateral walls 9 transversally, in particular perpendicularly, protrude towards the opening and away from the lateral wall 9 facing the opening.

In particular, door 4 is coupled to main body 2 such to be moveable between a closing position (see Figure 1 and door 4 being drawn in solid lines) and an opening positon (see Figure 1 and door 4 being drawn in dashed lines) at which door 4 is configured to respectively close the opening for impeding access to treatment cavity 3 and to open the opening for allowing access to treatment cavity 3. Even more particular, door 4 is configured to angularly move around a respective rotation axis defined by hinge assembly(ies) 6 so as to move between the closing position and the opening position.

In particular, hinge assembly(ies) 6 are configured such to secure door 4 to main body 2 and to allow to detach door 4 from main body 2 (if required).

With particular reference to Figures 2 to 4, each hinge assembly 6 comprises at least:

- a first coupling body 15 being and/or configured to be coupled to main body 2;

- a connection unit 16 removably connected to first coupling body 15;

- a second coupling body 17 being and/or configured to be coupled to door 4 and being pivoted to connection unit 16 and being configured to angularly move around a first pivot axis B so as to control second coupling body 17 between at least a first angular position (shown in Figures 2 to 4) and a second angular position (with respect to first pivot axis B), in particular at which door 4 is at respectively the closing position and the opening position; and

- a locking unit 18, in particular in the form of a saddle bracket, pivoted to connection unit 16 and angularly moveable around a second pivot axis C and moveable (rotatable) around second pivot axis C between at least an active angular position at which locking unit 18 is configured to interact with first coupling body 15 and a rest angular position, in particular at which locking unit 18 is detached from first coupling body 15 (i.e. locking unit 18 is prevented from interacting with first coupling body 15).

According to some preferred non-limiting embodiments, main body 2, in particular one of base walls 7 and/or lateral wall assembly 8, comprises at least one, preferentially two, receiving seat(s), each one being configured to receive and/or house one respective first coupling body 15.

According to some preferred non-limiting embodiments, door 4 comprises at least one, preferentially two, housing seats, each one configured to receive and/or house one respective second coupling body 17.

In particular, each first coupling body 15 is configured to be mounted within the respective receiving seat so as to couple the respective hinge assembly 6 to main body 2 and each second coupling body 16 is configured to be mounted within the respective housing seat so as to couple the respective hinge assembly 6 to door 4. In this manner, each hinge assembly 6 couples door 4 to main body 2.

In particular, door 4 is moveable between the closing position and the opening position by angularly moving the respective second coupling bodies 17 between the respective first angular position and second angular position. In use, such angular movement is activated by a user exerting a respective opening or closing force on door 4.

In particular, each connection unit 16 is removably connected to the respective first coupling body 15 so as to allow for detachment of connection unit 16 from first coupling body 15, which allows for detachment of door 4 from main body 2. Attachment and detachment of connection unit 16 can be repeatedly executed.

According to some preferred non-limiting embodiments, each connection unit 16 comprises a connection arm 19 removably connected to the respective first coupling body 15. In particular, each second coupling body 17 is pivoted to the respective connection arm 19 by means of a fixing element, such as a pin. Even more particular, the respective fixing element defines the respective first pivot axis B.

Preferentially, each connection arm 19 comprises one or more interaction portions configured to interact with interaction members of the respective first coupling body 15 so as to removably couple connection arm 19 (and connection unit 16) to the respective first coupling body 5.

Preferentially, each connection arm 19 has a substantially plate-like configuration.

According to some preferred non-limiting embodiments, each first coupling body 15 comprises a housing 20 having an aperture 21 for receiving at least a portion of the respective connection unit 16, in particular the respective connection arm 19, and in particular carrying the respective interaction members.

In particular, each housing 20 comprises at least one pair of lateral walls 22 at least partially delimiting aperture 21. Even more particular, lateral walls 22 of each pair are spaced apart from and parallel to one another. Preferentially, each lateral wall 22 is (substantially) parallel to first axis A with the respective first coupling body 15 being mounted to main body 2.

Advantageously, each locking unit 18 is configured to selectively impede and

allow detachment of the respective connection unit 16, in particular the respective connection arm 19, from the respective first coupling body 15, when being respectively in the active angular position and the rest angular position.

According to some preferred non-limiting embodiments, each locking unit 18 is configured to interact with at least portions of the respective lateral walls 22 when being in the respective active angular position.

In particular, each locking unit 18 presents a saddle-like configuration.

Preferentially, each locking unit 18 comprises at least:

- two lateral elements 23, in particular having respective plate-like configurations, spaced apparat from one another and interposing at least a portion of the respective connection arm 19 between one another; and

- a coupling member 24 connecting the two lateral elements 23 with one another.

According to a preferred non-limiting embodiments, at least one, preferentially both, lateral elements 23, comprise a respective (outer) ripped gripping surface 25 designed so as to improve the gripping behaviour of locking unit 18.

Advantageously, each locking unit 18 comprises an engagement surface 28 and the respective first coupling body 15 comprises an abutment surface 29. Each locking unit 18 is configured to abut against the respective abutment surface 29 with locking unit 18 being in the active angular position so as to generate a locking force for impeding detachment of the respective connection unit 16, in particular the respective connection arm 19, from the respective first coupling body 15. In particular, with the respective locking unit 18 being in the rest angular position, each engagement surface 28 is distanced/detached from the respective abutment surface 29 such that it is possible to detach the respective connection unit 16, in particular the respective connection arm 19, from the respective first coupling body 15.

Preferentially, the respective shape and/or configuration of each engagement surface 28 and the respective abutment surface 29 remains unvaried upon interaction between each engagement surface 28 and the respective abutment surface 29. In other words, abutment of each engagement surface 28 with its respective abutment surface

29 does not influence the shape and/or configuration of each engagement surface 28 and the respective abutment surface 29.

According to some preferred non-limiting embodiments, each lateral element 23 and each lateral edge 22 comprises a respective section of respectively the corresponding engagement surface 28 and the corresponding abutment surface 29, In particular, the respective section of each lateral element 23 is designed to abut against the respective section of the respective abutment surface 29 with the respective locking unit 18 being in the active angular position.

According to the embodiment shown in Figures 2 to 4, each abutment surface 29 and the respective engagement surface 28 are complementary to one another. In particular, each abutment surface 29 and each engagement surface 28 are multiform; i.e. they cannot described by a simple plane.

Preferentially, each abutment surface 29 and the respective engagement surface 28 are designed such that the locking force is directed along a direction D below of pivot axis C (with hinge assembly 6 being coupled to main body 2 and with locking unit 18 being in the active angular position) or at least towards and into the respective second pivot axis C.

In particular, by directing the locking force along direction D creates a positive torque which guarantees to retain the locking unit in the active angular position.

In other words, the locking force is directed along direction D such that an intersection point of a normal axis extending from a support surface (e.g. a kitchen floor or similar) directly or indirectly carrying the respective domestic appliance 1 with the vector of direction D lies within second pivot axis C or is interposed between the support surface and second pivot axis C.

According to some preferred non-limiting embodiments, each hinge assembly 6 is designed such that when, in use, being connected to the respective main body 2 and with the respective locking unit 18 being in the active angular position, the respective abutment surface 29 and the respective engagement surface 28 are transversally arranged with respect to the respective base walls 7 and/or a support surface (e.g. a kitchen floor or similar) directly or indirectly carrying the respective

domestic appliance 1.

According to some preferred non-limiting embodiments, each abutment surface 29 comprises at least a first surface portion 30 and at least a second surface portion 31 transversal and connected to one another and each engagement surface 28 comprises at least a third surface portion 32 and a fourth surface portion 33 transversal to and connected to one another. In particular, each locking unit 18 is designed such that when being, in use, in the active angular positon the respective third surface portion 32 abuts against the respective first surface portion 30 and the respective fourth surface portion 33 abuts against the second surface portion 31.

Preferentially, each first surface portion 30 and the respective third surface portion 32 face and/or are parallel to one another with the respective locking unit 18 being in the active angular position and each second surface portion 31 and the respective fourth surface portion 33 face and/or are parallel to one another with the respective locking unit 18 being in the active angular position.

Preferentially, each first surface portion 30 and the respective second surface portion 31 are connected to one another along a first connection portion 34 and each third surface portion 32 and the respective fourth surface portion 33 are connected to one another along a second connection portion 35.

Preferentially, each first connection portion 34 and each second connection portion 35 defines a respective plurality of extrema, in particular a plurality of inflection points.

According to some preferred non-limiting embodiments, each abutment surface 29 is mirror symmetric with respect to a respective mirror axis comprising the first connection portion 34 and each engagement surface 28 is mirror symmetric with respect to a respective mirror axis comprising the respective second connection portion 35. In particular, each mirror axis is transversal, in particular perpendicular, to lateral wall assembly 8 with the respective hinge assembly 6 being mounted to main body 2 and with the respective locking unit 18 being in the active angular position.

Preferentially, each engagement surface 28 and the respective abutment surface 29 are configured such that with the respective locking unit 18 being in the active

angular position, the respective first connection portion 34 and the second connection portion 35 are parallel to and face one another.

According to the non-limiting embodiment shown in Figures 2 to 4, each first surface portion 30, each second surface portion 31, each third surface portion 32 and each fourth surface portion 33 present plane configurations; i.e. each first surface portion 30, each second surface portion 31, each third surface portion 32 and each fourth surface portion 33 lies within a respective plane.

In particular, each lateral wall 22 comprises a section of the respective first surface portion 30 and of the respective second surface portion 31 and each lateral element 23 comprises a section of the respective third surface portion 32 and of the respective fourth surface portion 33.

According to the embodiment shown in Figures 2 to 4, a respective cross-sectional profile of engagement surface 28 and of abutment surface 29 is V-shaped or at least V-like shaped. In particular, the respective cross-sectional plane is transversal, in particular perpendicular, to respectively the corresponding second connection portion 35 and the corresponding first connection portion 34, and even more particular also transversal, in particular perpendicular, to base walls 7 with the respective hinge assembly 6 being couple to main body 2 and with the respective locking unit 18 being in the active angular position.

In use, each locking unit 18 being in the active angular position guarantees that the respective connection unit 16 remains secured to the respective first coupling body 15. In order to decouple door 4 from main body 2 it is necessary to angularly move the respective locking units 18 around the respective second pivot axis C and from the active angular position to the rest angular position. As this movement is reversible, it is possible to repeatedly couple and decouple the respective connection unit 16 to and from the respective fist coupling body 15.

With reference to Figures 5 to 6b, number 6’ indicates an alternative embodiment of a hinge assembly according to the present invention; as hinge assembly 6’ is similar to hinge assembly 6, the following description is limited to the differences between them, and using the same references, where possible, for identical or

corresponding parts.

In particular, hinge assembly 6' differs from hinge assembly 6 in that each engagement surface 28 and each abutment surface 29 present curved shapes and/or profiles and/or configurations. In particular, each engagement surface 28 and each abutment surface 29 can be described by respective outer surface sections of a respective imaginary sphere.

Accordingly, also each first surface portion 30, each second surface portion 31, each third surface portion 32 and each fourth surface portion 33 present respective curved configurations and/or curved shapes and/or curved profiles.

In particular, the respective cross-sectional profiles of engagement surface 28 and of abutment surface 29 are (substantially) U-shaped or (substantially) C-shaped.

Preferentially, locking unit 18 also comprises an interaction element 36 configured to abut against second coupling body 17 with locking unit 18 being arranged in the rest angular position.

As function of hinge assembly 6' is similar to function of hinge assembly 6, we refer to the above-provided description.

With reference to Figures 7 to 8b, number 6'' indicates an alternative embodiment of a hinge assembly according to the present invention; as hinge assembly 6'' is similar to hinge assembly 6, the following description is limited to the differences between them, and using the same references, where possible, for identical or corresponding parts.

In particular, hinge assembly 6'' differs from hinge assembly 6 in that each engagement surface 28 and each abutment surface 29 comprise a respective single surface portion having a plane configuration. In other words, each engagement surface 28 and each abutment surface 29 can be described by a respective single plane, which is different to the respective engagement surfaces 28 and the respective abutment surface 29 of hinge assembly 6 and of hinge assembly 6'.

Thus, hinge assembly 6'' differs from hinge assembly 6 and hinge assembly 6' in that abutment surfaces 29 and engagement surfaces 28 are not multiform.

Furthermore, each engagement surface 28 and the respective abutment surface

29 are parallel to one another with the respective locking unit 18 being in the respective active angular position.

As function of hinge assembly 6'' is similar to function of hinge assembly 6, we refer to the above-provided description.

The advantages of hinge assemblies 6, 6', and 6'' according to the present invention will be clear from the foregoing description.

In particular, by providing for a complementary and/or parallel design of abutment surface 29 and engagement surface 28 it is possible to obtain a smoother movement of locking unit 18.

Another advantage resides in guaranteeing an enlarged interaction surface improving the control of the locking force.

An even other advantage resides in that the angular movement of locking unit 18 between the active angular position and the rest angular position is facilitated.

A further advantage is seen in reduced wear, improving the overall life cycle of hinge assemblies 6, 6' and 6''.

Additionally, it must be noted that locking unit 18 remains permanently in its active angular position without the need for additional fasteners.

Furthermore, locking unit 18 can be easily attached to connection unit 16.

An additional advantages lies also in the cost-effectiveness of hinge assemblies 6, 6' and 6''.

Clearly, changes may be made to hinge assemblies 6, 6', 6'' without, however, departing from the scope of the present invention.

According to an alternative embodiment not shown, each engagement surface 28 is shaped such that the respective third surface portion 32 having a curved configuration and the respective fourth surface portion 33 having a plane configuration and each abutment surface 29 is shaped such that the respective first surface portion 30 has a curved configuration and the respective second surface portion 31 has a plane configuration.

CLAIMS

1.- Hinge assembly (6, 6', 6'') for a domestic appliance (1), in particular an oven, for the treatment of food products comprising:

- a first coupling body (15) configured to be coupled to a main body (2) of the domestic appliance (1);

- a connection unit (16) removably connected to the first coupling body (15);

- a second coupling body (17) configured to be coupled to a door (4) of the domestic appliance (1) and being pivoted to the connection unit (16) and is configured to angularly move around a first pivot axis (B) so as to control the second coupling body (17) between at least a first angular position and a second angular position; and

- a locking unit (18) pivoted to the connection unit (16) and angularly moveable around a second pivot axis (C) and moveable between at least an active angular position at which the locking unit (18) is configured to interact with the first coupling body (15) and a rest angular position;

wherein the locking unit (18) comprises an engagement surface (28) configured to abut against an abutment surface (29) of the first coupling body (15) with the locking unit (18) being in the active angular position so as to generate a locking force for impeding detachment of the connection unit (16) from the first coupling body (15);

wherein the abutment surface (29) and the engagement surface (28) are complementary to one another and/or are parallel to one another with the locking unit (18) being in the active angular position.

2.- Hinge assembly according to claim 1 or 2, wherein the abutment surface (29) and the engagement surface (28) are designed such that the locking force originating, in use, from the interaction between the engagement surface (28) and the abutment surface (29) is directed below or into the second pivot axis (C).

3.- Hinge assembly according claim 1 or 2, wherein the main body (2) of the domestic appliance (1) comprises two base walls (7) spaced apart along a first axis (A) and a lateral wall assembly (8) arranged between the base walls (7);

wherein the base walls (7) and the lateral wall assembly (8) define a treatment cavity (3) of the domestic appliance (1) configured to be selectively opened or closed

by the door (4);

wherein the hinge assembly (6, 6', 6'') is designed such that with the hinge assembly (6, 6', 6'') being connected to the main body (2) and with the locking unit (18) being in the active angular position, the abutment surface (29) and the engagement surface (28) are transversally arranged with respect to the base walls (7).

4.- Hinge assembly according to any one of the preceding claims, wherein the abutment surface (29) and the engagement surface (28) present curved profiles and/or are multiform.

5.- Hinge assembly according to any one of the preceding claims, wherein the abutment surface (29) comprises at least a first surface portion (30) and at least a second surface portion (31) transversal and/or connected to one another and the engagement surface (28) comprises at least a third surface portion (32) and a fourth surface portion (33) transversal and/or connected to one another;

wherein with the locking unit (18) being in the active angular positon the respective third surface portion (32) abuts against the first surface portion (30) and the fourth surface portion (33) abuts against the second surface portion (31).

6.- Hinge assembly according to claim 5, wherein the first surface portion (30) and the third surface portion (32) face and/or are parallel to one another and the second surface portion (31) and the fourth surface portion (33) face and/or are parallel to one another with the locking unit (18) being in the active angular position.

7.- Hinge assembly according to claim 5 or 6, wherein the first surface portion (30) and the second surface portion (31) are connected to one another along a first connection portion (34) and/or the third surface portion (32) and the fourth surface portion (33) are connected to one another along a second connection portion (35);

wherein the abutment surface (29) is mirror symmetric with respect to a respective mirror axis comprising the first connection portion (34) and/or the engagement surface (28) is mirror symmetric with respect to a respective mirror axis comprising the second connection portion (35); and/or

wherein the first connection portion (34) and the second connection portion (35) define a respective plurality of extrema.

8.- Hinge assembly according to any one of claims 5 to 7, wherein the first surface portion (30), the second surface portion (31), the third surface portion (32) and the fourth surface portion (33) present curved configurations or plane configurations.

9.- Hinge assembly according to any one of claims 1 to 4, wherein the abutment surface (29) and the engagement surface (28) comprise each one single respective plane surface portion;

wherein the hinge assembly (6'') is designed such that with the locking unit (18) being in the active angular position and the hinge assembly (6'') being coupled to the main body (2) the abutment surface (29) and the engagement portion (28) are parallel to an axis being vertical with respect to a support surface of the domestic appliance (1).

10.- Hinge assembly according to any one of the preceding claims, wherein the connection unit (16) comprises at least a connection arm (19) connected to the second coupling body (17) and removably connected to the first coupling body (15);

wherein the locking unit (18) comprises at least:

- two lateral elements (23) spaced apparat from one another and interposing at least a portion of the connection arm (19) between one another; and

- a coupling member (24) connecting the two lateral elements (23) with one another;

wherein each lateral element (23) comprises at least a respective section of the engagement surface (28).

11.- Hinge assembly according to any one of the preceding claims, wherein the connection unit (16) comprises at least a connection arm (19) connected to the second coupling body (17) and removably connected to the first coupling body (15);

wherein the locking unit (18) comprises at least two lateral elements (23) spaced apparat from one another and interposing at least a portion of the connection arm (19) between one another;

wherein at least one of the lateral elements (23) comprises a ribbed gripping surface (25).

12.- Hinge assembly according to any one of the preceding claims, wherein the

first coupling body (15) comprises a housing (20) having an opening (21) for receiving at least a portion of the connection unit (16);

wherein the housing (20) comprises at least two lateral walls (22) at least partially delimiting the opening (21) and each lateral wall (22) comprises a respective section of the abutment surface (29).

13.- Domestic appliance (1), in particular an oven, having a main body (2), a door (4) and at least one hinge assembly (6, 6', 6'') according to any one of the preceding claims for moveably coupling the door (4) to the main body (2).

14.- Domestic appliance according to claim 12, wherein the main body (2) comprises two base walls (7) spaced apart along a first axis (A) and a lateral wall assembly (8) arranged between the base walls (7);

wherein the base walls (7) and the lateral wall assembly (8) define a treatment cavity (3) of the domestic appliance (1) configured to be selectively opened or closed by the door (4);

wherein the main body (2) comprises at least one receiving seat for the first coupling body (15).

15.- Domestic appliance according to claim 13 or 14, wherein the door (4) is detachable from the main body (2) with the locking unit (18) being controlled in the rest angular position.

ABSTRACT

There is described a hinge assembly (6, 6', 6'') for a domestic appliance (1), in particular an oven, for the treatment of food products. The hinge assembly (6, 6', 6'') comprises a first coupling body (15) configured to be coupled to a main body (2) of the domestic appliance (1), a connection unit (16) removably connected to the first coupling body (15), a second coupling body (17) configured to be coupled to a door (4) of the domestic appliance (1) and being pivoted to the connection unit (16) and is configured to angularly move around a first pivot axis (B) so as to control the second coupling body (17) between at least a first angular position and a second angular position and a locking unit (18) pivoted to the connection unit (16) and angularly moveable around a second pivot axis (C) and moveable between at least an active angular position at which the locking unit (18) is configured to interact with the first coupling body (15) and a rest angular position. The locking unit (18) comprises an engagement surface (28) configured to abut against an abutment surface (29) of the first coupling body (15) with the locking unit (18) being in the active angular position so as to generate a locking force for impeding detachment of the connection unit (16) from the first coupling body (15) and the abutment surface (29) and the engagement surface (28) are complementary to one another and/or are parallel to one another with the locking unit (18) being in the active angular position.

(Figure 5)

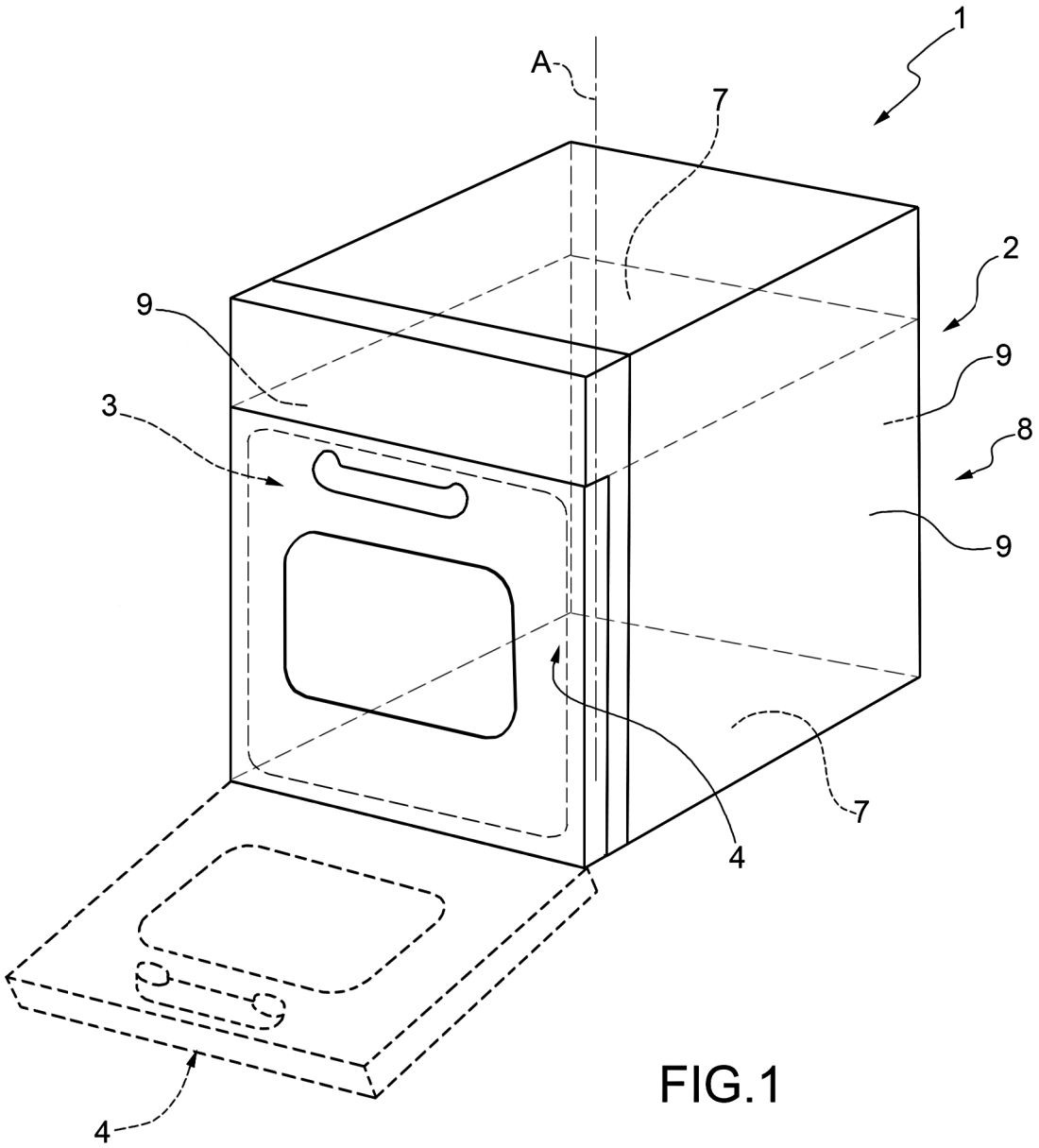

FIG.1

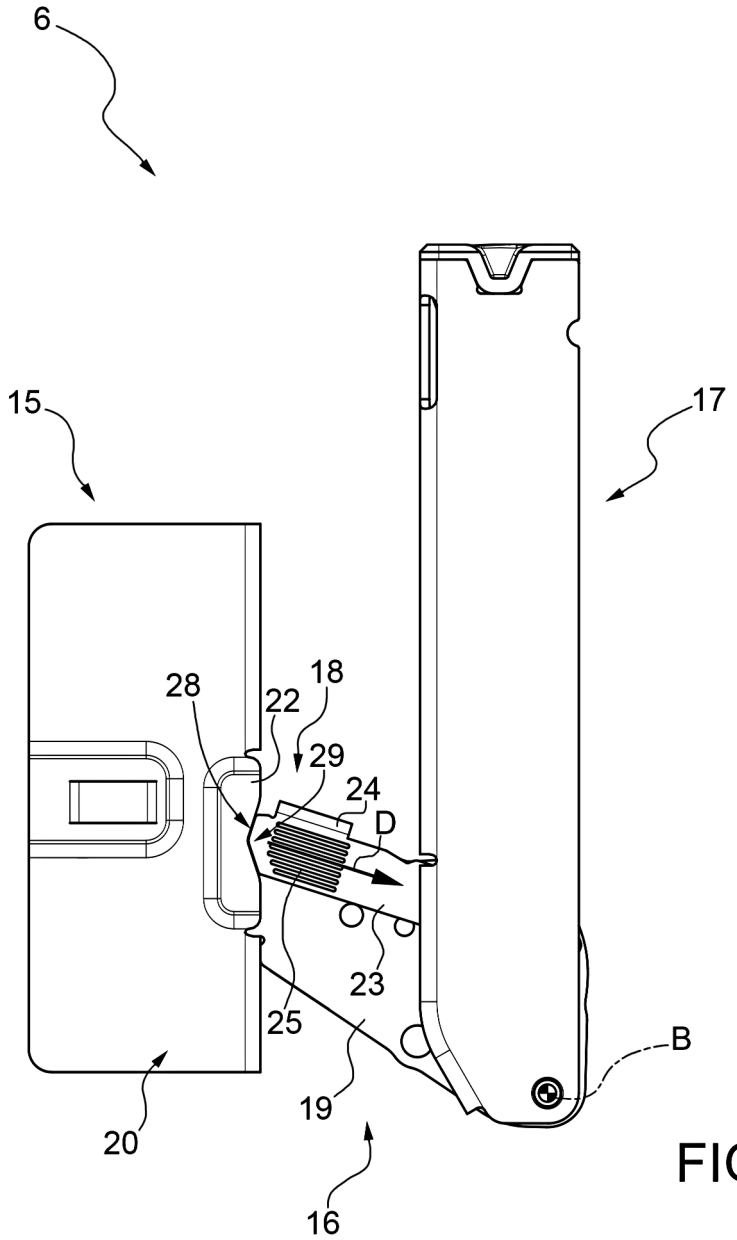

FIG.2

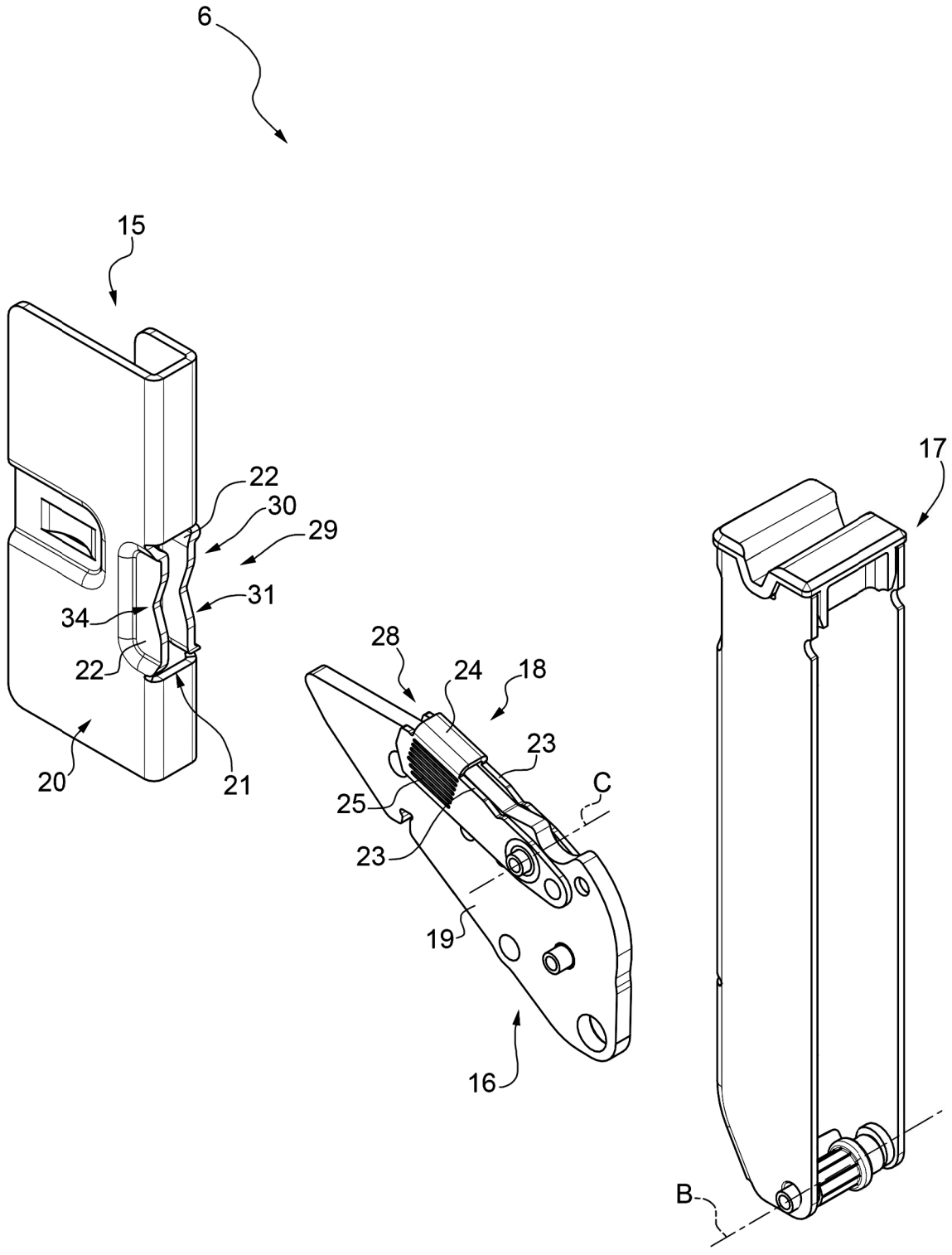

FIG.3a

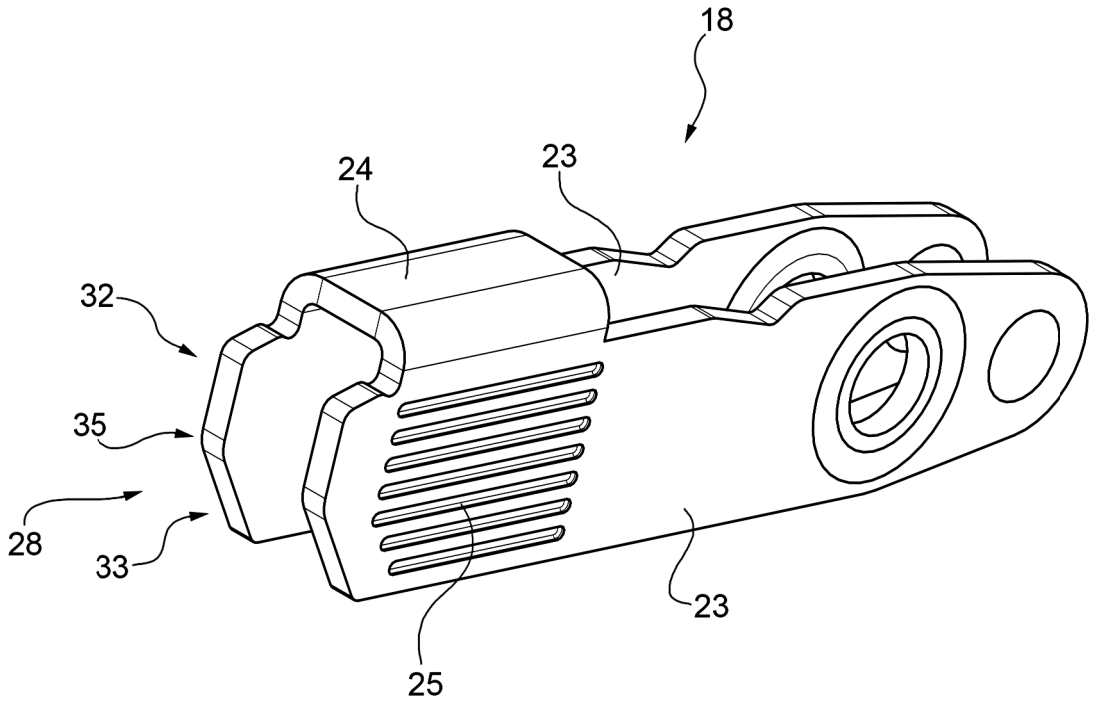

FIG.3b

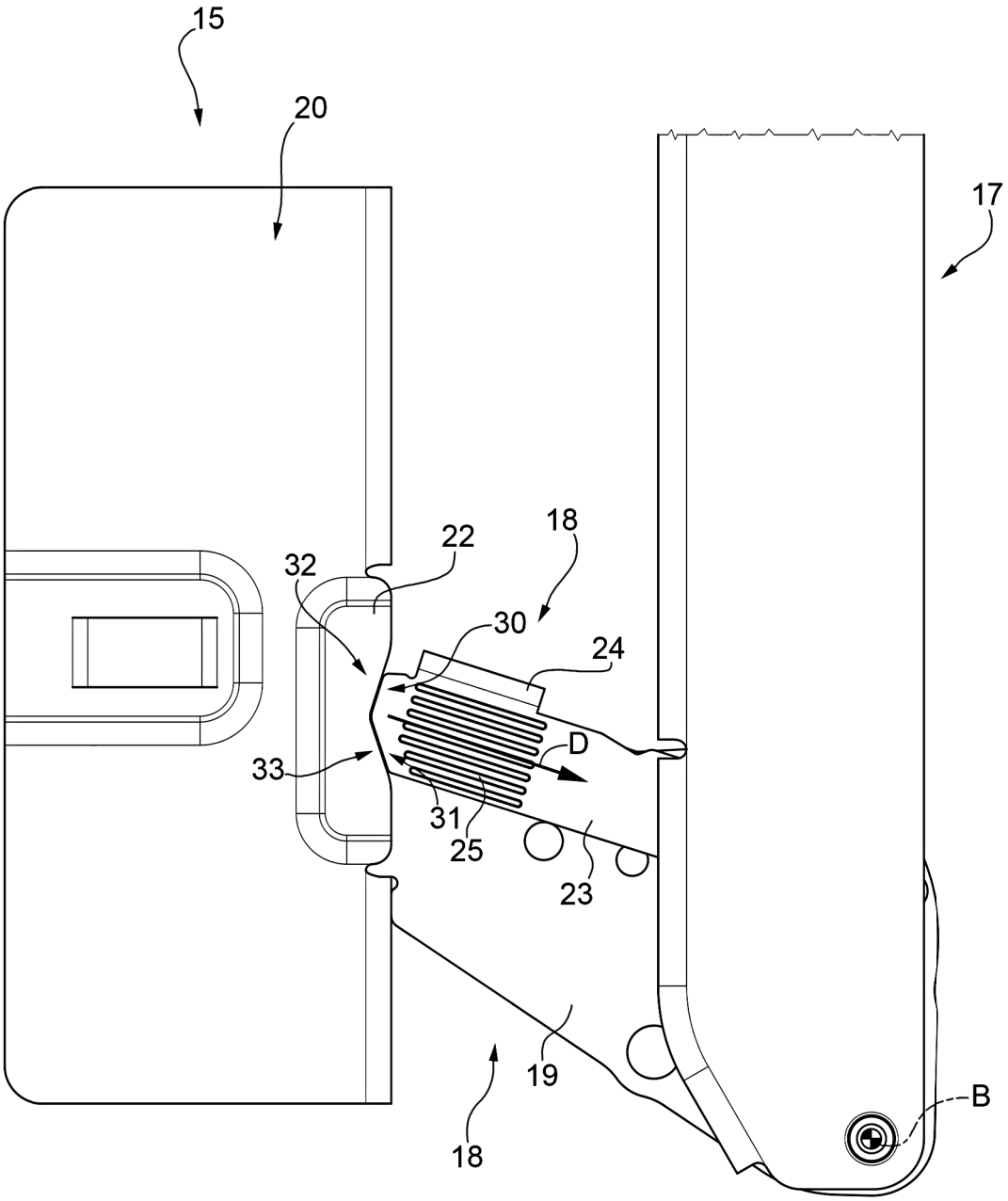

FIG.4

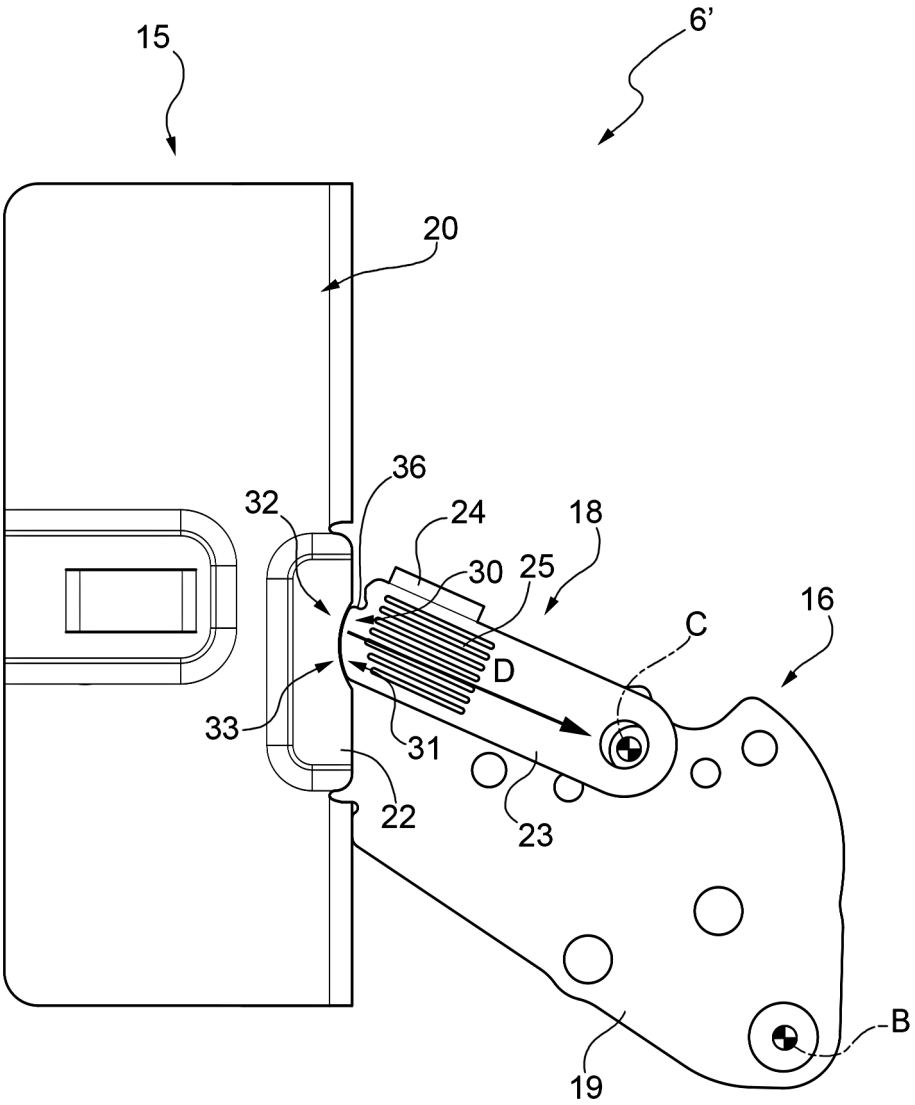

FIG.5

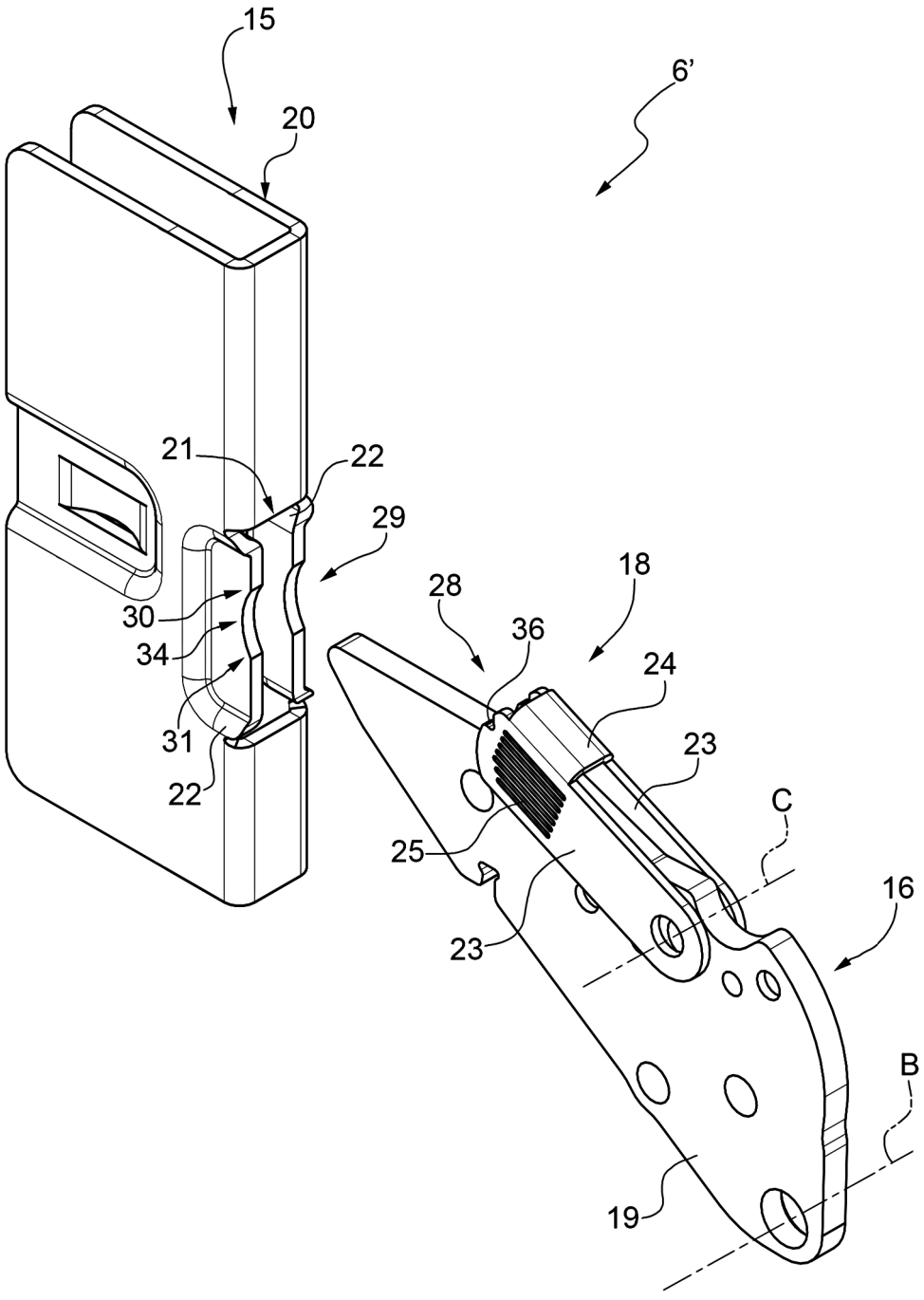

FIG.6a

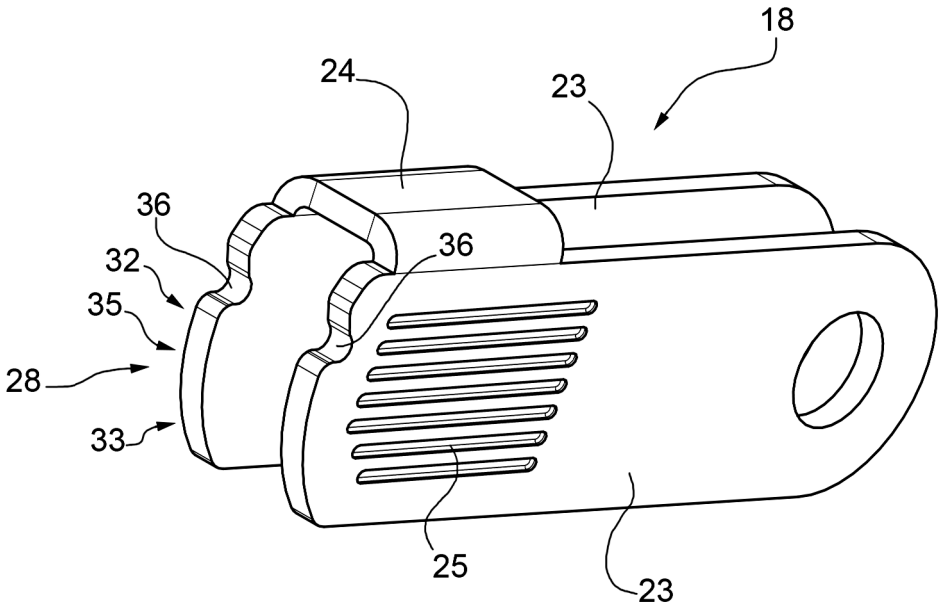

FIG.6b

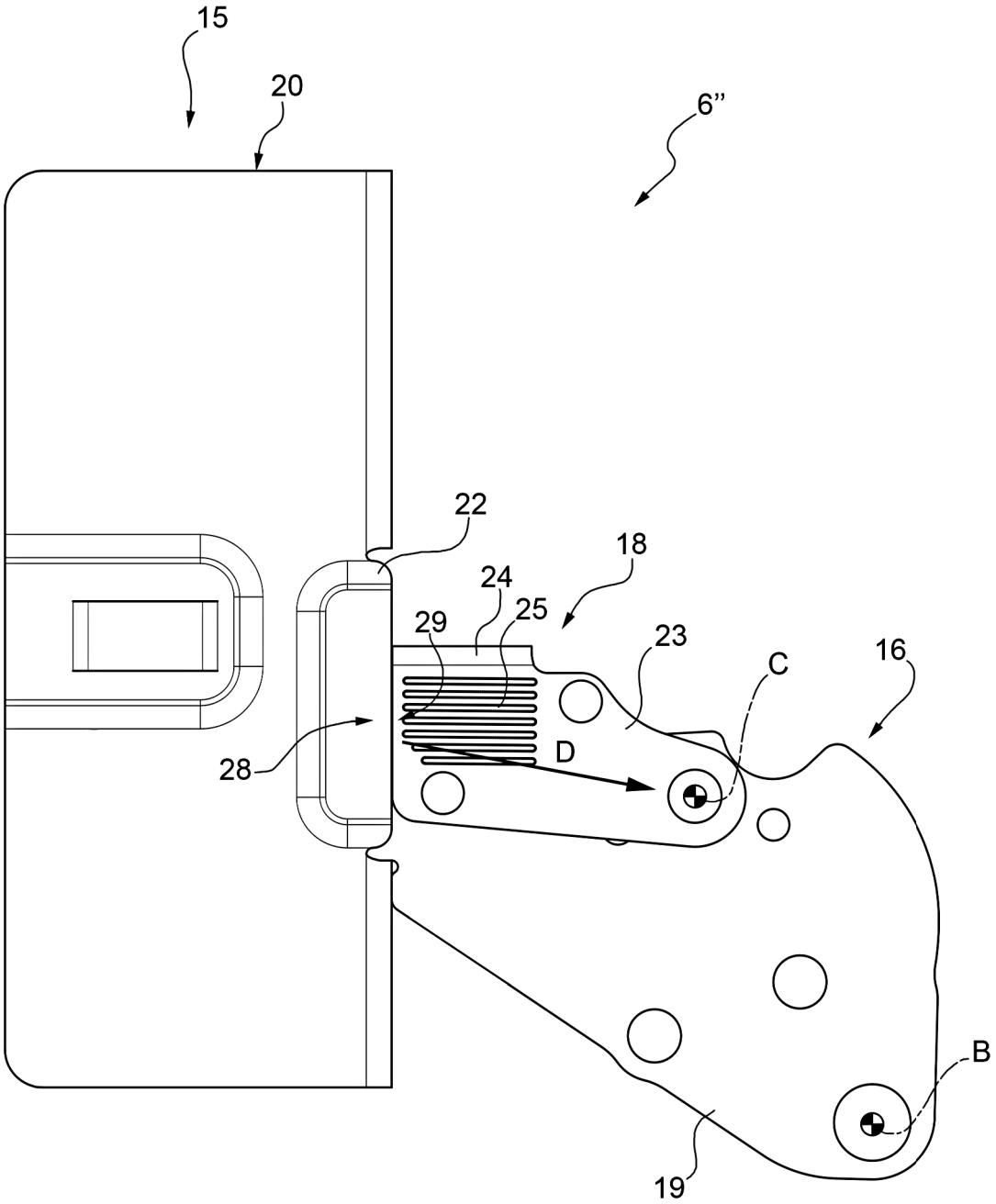

FIG.7

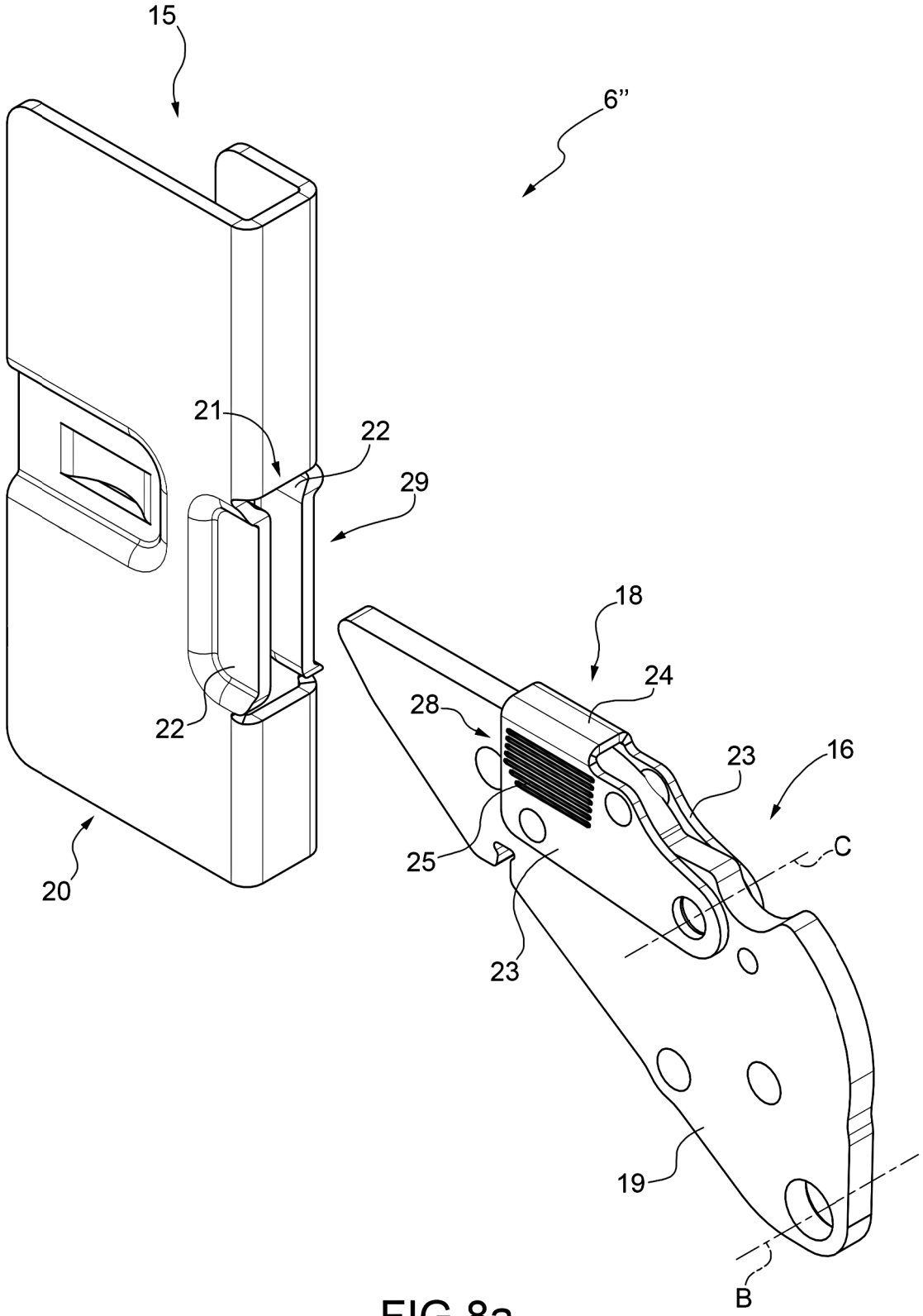

FIG.8a

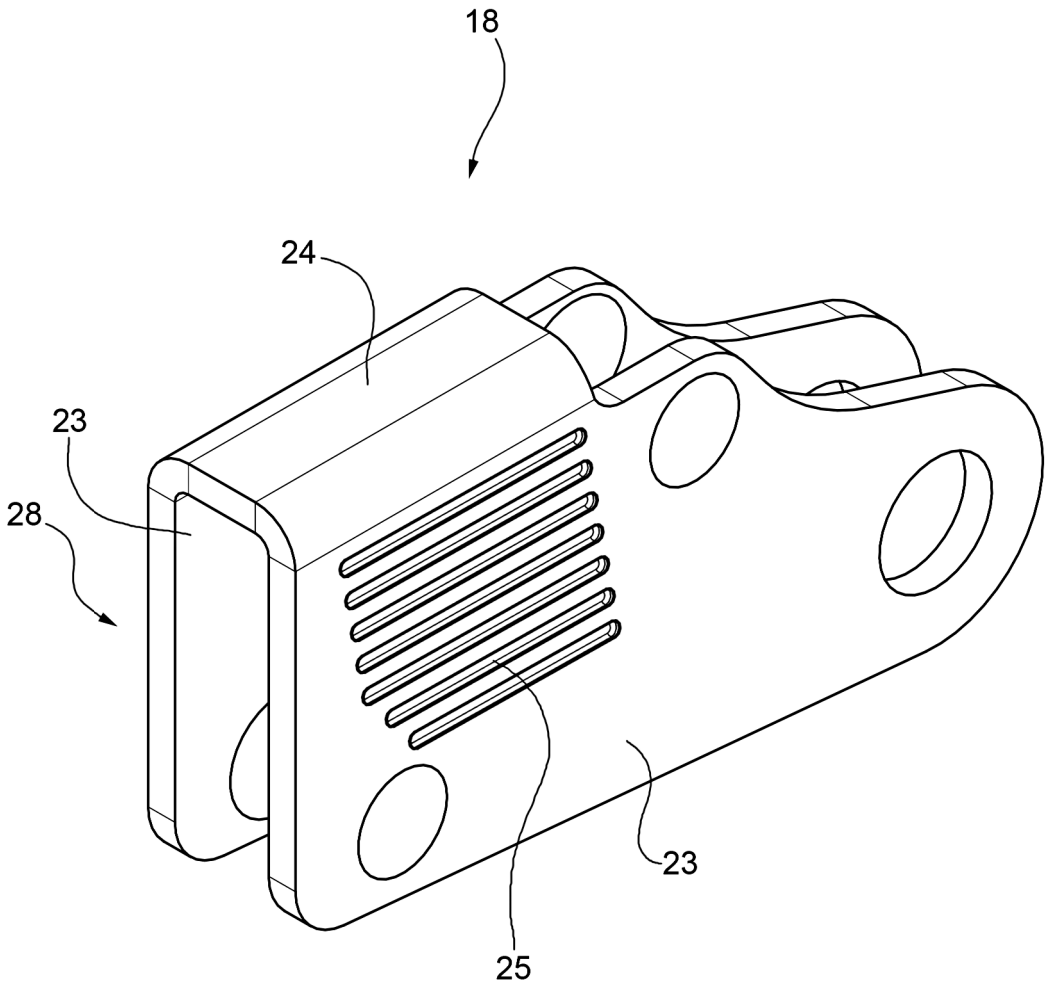

FIG.8b